

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 8

REMARKS

Claims 1 through 15 and new Claims 16 through 27 are pending in the application.

Claim 1 has been amended to reflect the compounds of the invention are preservatives. Support for this amendment can be found in the Application-as-filed, for example on Page 1, lines 4 through 6 and Page 2, line 12 through Page 3, line 8.

Claim 1 has also been amended to reflect the beneficial incorporation of sorbate or benzoate anions. Support for this amendment can be found in the Application-as-filed, for example on Page 3, lines 14 through 16.

Claim 1 has additionally been amended to reflect that the alkyl group within the recited preservatives are advantageously a mixture of chain lengths. Support for this amendment can be found in the Application-as-filed, for example on Page 10, line 26 through Page 12, line 10.

Claims 2 through 12 have been canceled, as their subject matter has been incorporated into newly added claims presented in a more traditional US format.

Claim 15 has been amended to similarly reflect a more traditional US format for method claims. Support for this amendment can be found in the Application-as-filed, for example on Page 4, lines 4 through 9.

Claims 16 through 27 have been added to complete the record for examination and highlight particularly advantageous embodiments of the invention.

Claim 16 is directed to advantageous processes in accordance with the invention in which the sorbic acid salt is potassium sorbate and the benzoic acid salt is sodium benzoate. Support for Claim 16 can be found in the Application-as-filed, for example on Page 4, lines 4 through 6.

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 9

Claim 17 is directed to advantageous compositions in accordance with the invention that exhibit a pH of less than 7.0. Support for Claim 17 can be found in the Application-as-filed, for example on Page 3, lines 4 through 10.

Claim 18 is directed to advantageous food compositions that include the recited compound in amounts ranging from about 0.005 to 1.0 percent by weight. Support for Claim 18 can be found in the Application-as-filed, for example on Page 7, line 1 through Page 8, line 30.

Claim 19 is directed to beneficial aspects of such compositions, in which the compound is a surface treatment that is applied as a solution. Support for Claim 19 can be found in the Application-as-filed, for example on Page 7, lines 14 through 17 and Page 8, lines 8 through 10 and Page 9, lines 1 through 4.

Claim 20 is directed to further advantageous aspects of such compositions, in which the surface treatment includes the recited compound in amounts of up to 10 % by weight. Support for Claim 20 can be found in the Application-as-filed, for example on Page 7, lines 14 through 17.

Claim 21 is directed to advantageous animal feed compositions that include the recited compound in amounts ranging up to 2.5 percent by weight. Support for Claim 21 can be found in the Application-as-filed, for example on Page 9, lines 18 through 27.

Claim 22 is directed to advantageous cosmetic compositions that include the recited compound in amounts ranging from about 0.01 to 0.5 percent by weight. Support for Claim 22 can be found in the Application-as-filed, for example on Page 10, line 10 through Page 6, line 5.

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 10

Claim 23 is directed to advantageous cleaning compositions that include the recited compound in amounts ranging from about 0.005 to 0.5 percent by weight. Support for Claim 23 can be found in the Application-as-filed, for example on Page 6, lines 7 through 28.

Claim 24 is directed to advantageous packaging compositions that include the recited compound in amounts ranging from about 1 to 10 g/m². Support for Claim 24 can be found in the Application-as-filed, for example on Page 9, lines 6 through 16.

Claim 25 is directed to beneficial aspects of such embodiments in which the packaging is food packaging. Support for Claim 25 can be found in the Application-as-filed, for example on Page 9 lines 12 through 16.

Claim 26 is directed to advantageous drug compositions that include the recited compound in amounts ranging from about 0.005 to 0.5 percent by weight. Support for Claim 26 can be found in the Application-as-filed, for example on Page 9, line 29 through Page 10, line 2.

Claim 27 is directed to advantageous paint compositions that include the recited compound in amounts ranging from about 0.05 to 2.0 percent by weight. Support for Claim 27 can be found in the Application-as-filed, for example on Page 10, lines 16 through 18.

The specification has been amended to correct specific chemical terminology, as suggested by the Examiner. Support for this amendment can be found in the Application-as-filed, for example on Page 3, lines 14 through 16.

Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 11

Section 112 Rejection

Claims 1 through 15 and the specification stand rejected and objected to, respectively, over the terms "sorboyl" and "benzoyl." The Examiner is correct in that "sorbate" and "benzoate" were intended. Accordingly, Claim 1 has been amended to recite "sorbate" and "benzoate" in lieu of "sorboyl" and "benzoyl." The specification on Page 3, line 23 has likewise been amended to recite "sorbate" and "benzoate." As noted above, support for this amendment can be found in the Application-as-filed. Applicants accordingly respectfully request withdrawal of this rejection.

Claims 1 through 15 stand further rejected over the he parenthetical expression "(trans, trans CH₃-CH=CH=CH=CH-COO)." As suggested by the Examiner, the term "(trans, trans CH₃-CH=CH=CH=CH-COO)" has deleted from Claim 1. Applicants accordingly respectfully request withdrawal of this rejection

Claims 2 through 12 stand rejected, apparently over the recitation of compositions within a compound claim. Claims 2 through 12 have accordingly been canceled. New Claims 17 through 27 have been added to present the numerous advantageous products of the invention in a more traditional compositional format. Applicants accordingly respectfully request withdrawal of this rejection

Applicants take this opportunity to respectfully submit that, in contrast to the opinion urged within the Office Action, the terms "food", "animal feed", "cosmetics", "packaging", "drug", "surface treatment" and the like are well understood to those skilled in the art.

Claim 15 stands rejected due to a lack of conventional process steps. Claim 15 has been amended into a more traditional process claim format. As noted above, support for this amendment can be found in the Application-as-filed. Applicants accordingly respectfully request withdrawal of this rejection.

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 12

The Claimed Invention is Patentable in Light of the Art of Record

Claims 1 through 15 stand rejected as either anticipated by or obvious in light of United States Patent No. 4,804,492 ("US 492"), optionally in view of United States Patent No. 3,361,794 ("US 794"). Claims 1 through 15 also stand rejected as either anticipated by or obvious in light of JP 55-115439 ("JP 439"). Claims 1 through 15 stand additionally rejected as being anticipated by or obvious in light of United States Patent No. 4,585,795 ("US 795"). Claims 1 through 15 stand further rejected as being obvious in light of US 794.

It may be useful to briefly consider the invention before addressing the merits of the rejection.

A number of microorganisms are known to feed on organic substances, such as food, pharmaceuticals, cosmetics and the like. Particular preservatives frequently exhibit highly specific activity towards certain microorganisms, such as bacteria, yeast or mold. The activity of preservative acids, such as sorbic acid or benzoic acid, is generally very low toward bacteria, for example. It is known that quaternary ammonium salts, commonly referred to as quats, have antimicrobial action. Unfortunately, quats are ineffective at lower pHs, especially against molds and yeasts. The pH of foods, pharmaceuticals, cosmetics and the like are generally acidic, however. The use of quats as antimicrobials has thus been quite limited to date, particularly in acidic products. (The Examiner's attention is kindly directed to the Application-as-filed on Page 2, lines 1 through 18).

Unexpectedly, Applicants have found compounds which not only have a bacteria destroying or bacteria-reducing microbiostatic action, but at the same time have an activity towards molds and yeasts at relatively low pHs, such as pHs of less than 7. Furthermore, the compounds of the invention can readily be incorporated into further compositions, such as foods, cosmetics and the like. The compounds of the invention may be incorporated into compositions in a number of forms, including as aqueous solutions.

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 13

The claims are thus generally directed to preservatives formed a quaternary ammonium cation and either a sorbate or benzoate anion.

In advantageous embodiments, the preservatives are formed from a mixture of the recited compounds, thereby providing a distribution of alkyl lengths within the resulting preservative, as reflected in Claim 1 as amended. The claimed invention also includes compositions having a pH of less than 7 that incorporate the recited compound. Exemplary compositions in accordance with the claimed invention include foods, animal feeds, cosmetics, cleaning compositions for articles or machines in contact with humans or foods, packaging, drugs, surface treatments, and paints, as recited in Claim 17. Claims 18, 20 through 24, 26 and 27 recite effective amounts of the instant compounds for various compositions. Claims 19 and 25 are directed to particularly advantageous embodiments of the invention.

The cited references do not teach or suggest the claimed invention.

US 492 is directed to sanitizing compositions, such as laundry detergent and hard surface cleaners, with diminished skin irritancy. (Col. 2, lines 45 – 50). The sanitizing compositions of US 492 include a non-ionic surfactant and a quaternary ammonium compound. (Col. 2, lines 52 – 59). The quaternary ammonium may be non-aromatic. (Col. 3, lines 9 – 23). The compositions are formed by merely mixing the various raw materials in water. (Col. 5, lines 6 – 11). US 492 notes the use of elevated amounts of its compound within its sanitizing compositions. In particular, US 492 notes that preferred compositions include about 10 weight percent quaternary ammonium. (Col. 5, lines 33 – 37 and Col. 6, lines 15 – 25). US 492 is silent as to the pH of its compositions.

US 492 does not teach or suggest the claimed invention. US 492 more particularly does not teach or suggest the recited mixed alkyl quaternary ammonium compounds of Claims 1, 13 and 14. US 492 also does not teach or suggest compositions having a pH of less than

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 14

7.0, and most certainly not the broad range of compositions recited in Claim 17. Nor does US 492 teach or suggest the recited effective amounts of the claimed quaternary compounds for particular compositions provided in Claims 18, 20 through 24, 26 and 27.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 492, considered either alone or in combination with the art.

US 794 does not cure the deficiencies in US 492. US 794 is directed water-insoluble compounds formed from a quaternary ammonium in combination with alkyl-aryl carboxylic acid. An exemplary alkyl-aryl carboxylic acid is toluic acid. (Col. 2, lines 13 – 15). US 794 is silent as to recommended effective amounts of its compositions. US 794 is further silent as to the pH of its composition.

US 794 thus does not teach or suggest the claimed invention. US 794 more particularly does not teach or suggest the sorbate or benzoate anion of Claims 1, 13 and 14. In fact, US 794 teaches away from such anions by requiring an alkyl-aryl carboxylic acid. US 794 also does not teach or suggest compositions having a pH of less than 7.0, as recited in Claim 17. Nor does US 794 teach or suggest the recited effective amounts of the claimed quaternary compounds for particular compositions provided in Claims 18, 20 through 24, 26 and 27.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 794, considered either alone or in combination with the art.

There would have been no motivation to have combined US 492 and US 794. Applicants respectfully submit that merely because the references can be combined is not enough, there must still be a suggestion. MPEP 2143.01 (section citing Mills). Applicants respectfully submit that the Office Action is indulging in impermissible hindsight by merely picking and choosing elements from the prior art while using the instant specification as the guide for that selection process.

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 15

However, even if combined (which Applicants submit should not be done), the claimed invention would not result. US 492 generically discloses sanitizing compositions including a relatively elevated amount of active ingredients. US 794 discloses compounds including an alkyl-aryl anion. Consequently, even if combined, the recited mixed alkyl quaternary ammonium compounds having a sorbate or benzoate anion of Claims 1, 13 and 14 would not have resulted. The combination also fails to teach or suggest compositions having a pH of less than 7.0, and most certainly not the broad range of compositions recited in Claim 17. Nor does the combination teach or suggest the recited effective amounts of the claimed quaternary compounds for particular compositions provided in Claims 18, 20 through 24, 26 and 27.

Further, neither US 492 nor US 794 address a primary issue solved by the instant application, i.e. imparting efficacy towards molds and yeasts to quaternary compounds at lower pHs. Accordingly, they can not suggest a solution to that problem.

Based on the foregoing, Applicants respectfully submit that the claimed invention is patentable in light of and US 492 and US 794, considered either alone or in combination.

JP 439 is directed to polyvinyl glyoxal solutions that are resistant to fungus. The abstract indicates that the polyvinyl glyoxal solutions include a particular quaternary ammonium. The abstract is silent as to the pH of the polyvinyl glyoxal solutions.

JP 439 likewise does not teach or suggest the claimed invention. JP 439 more particularly does not teach or suggest the recited mixed alkyl quaternary ammonium compounds of Claims 1, 13 and 14. JP 439 also does not teach or suggest compositions having a pH of less than 7.0, and most certainly not the broad range of compositions recited in Claim 17. Nor does JP 439 teach or suggest the recited effective amounts of the claimed quaternary compounds for particular compositions provided in Claims 18, 20 through 24, 26 and 27.

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 16

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of JP 439, considered either alone or in combination with the art.

US 795 is directed to compositions to protect timber from fungi. The compositions include a quaternary ammonium salt. US 795 notes that either non-aromatic quats or quaternarized pyridine may be used as the ammonium component. (Col. 2, lines 8 – 9). The pH range for the compositions of US 795 is from 7 to 10. (Col. 2, lines 64 – 65). US 795 goes on to state that “the initial pH of the control agent must, of course, be so high that the acid [used to form its quaternary ammonium salt] is in the form of a sodium salt.” (Col. 2, lines 53 – 56). The working examples generally disclose pHs ranging from 8.5 to 11.9. (Col. 12, Tables 3 through 6). The working examples of US 795 further indicate that the compositions retain a pH of over 8 upon wetting the timber. (Col. 8, lines 4 – 10).

US 795 thus does not teach or suggest the claimed invention. US 795 more particularly does not teach or suggest the recited mixed alkyl quaternary ammonium compounds of Claims 1, 13 and 14. US 795 also does not teach or suggest compositions having a pH of less than 7.0, and most certainly not the broad range of compositions recited in Claim 17. Nor does US 795 teach or suggest the recited effective amounts of the claimed quaternary compounds for particular compositions provided in Claims 18, 20 through 24, 26 and 27.

Accordingly, Applicants respectfully submit that the claimed invention is likewise patentable in light of US 795, considered either alone or in combination with the art.

CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1 and 13 through 27 are now in condition for immediate allowance. It is

Application No.: 10/730,180
Filing Date: December 8, 2003
Page: 17

requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,

Cathy Moore

Cathy R. Moore
Reg. No. 45,764

ProPat, L.L.C.
425-C South Sharon Amity Road
Charlotte, NC 28211-2841
Telephone: (704) 365-4881
Fax: (704) 365-4851
Customer No. 38263

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office at facsimile number (703) 872-9306 on *June 13, 2005*

Claire Wygand
Claire Wygand